AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

Listing of Claims:

Claim 1 (Previously Presented): A low-noise optical frequency converter, comprising:

means for converting an input light wave with a predetermined microwave electric signal to output a light wave that includes a first-order upper-sideband or lower-sideband and a third-order lower-sideband or upper-sideband,

means for modulating a light wave identical to the input light wave with a signal having an angular frequency that is three times that of the microwave electric signal to form a first light wave having a first-order lower-sideband or upper-sideband, and

means for mixing the first light wave with a second light wave having a first-order upper-sideband or lower-sideband and a third-order lower-sideband or upper-sideband, with a phase of the third-order lower-sideband or upper-sideband reversed to a phase of the first light wave to suppress third-order sidebands.

Claim 2 (Previously Presented): A low-noise optical frequency converter, comprising:

a light wave input section;

a modulation signal input section;

a modulated light wave output section;

a Mach-Zehnder interferometer type single sideband (SSB) modulator configured to modulate a light wave input to the light wave input section, provided with a first Mach-Zehnder interferometer type optical modulator and a second Mach-Zehnder interferometer type optical modulator on respective optical paths;

means for inputting a fundamental wave of a predetermined microwave electric signal;

a circuit configured to generate a wave having a frequency that is triple a frequency of the fundamental wave;

means for adjusting an amplitude of the triple-frequency wave;

delay means for adjusting a phase difference between the fundamental wave and the triple-frequency wave;

means for mixing the fundamental wave and the triple-frequency wave and generating an output; and

means for applying the mixing means output to the modulation signal input section;

wherein a noise component arising from the fundamental wave of the microwave electric signal is suppressed by a light wave component produced by modulation of the mixing means output with the triple-frequency wave.

Claim 3 (Previously Presented): The low-noise optical frequency converter according to claim 2, wherein the means for mixing and the means for applying the mixing means output to the modulation signal input section are constituted by a 90-degree hybrid configured to split the mixed fundamental wave and triple-frequency wave into two signals having a phase difference of substantially 90 degrees.

Claim 4 (Cancelled).

Claim 5 (Previously Presented): A low-noise optical frequency converter, comprising:

a light wave input section;

a modulation signal input section;

a modulated light wave output section;

a Mach-Zehnder interferometer type single sideband (SSB) modulator configured to modulate a light wave input to the light wave input section, provided with a first Mach-Zehnder interferometer type phase modulator and a second Mach-Zehnder interferometer type phase modulator on respective optical paths;

a first electrode configured to control a phase of a light wave provided on the first Mach-Zehnder interferometer type phase modulator;

a second electrode configured to control a phase of a light wave provided on the second Mach-Zehnder interferometer type phase modulator;

a third electrode configured to control a phase of a light wave propagating through each arm of the Mach-Zehnder interferometer type SSB modulator;

means for inputting a fundamental wave of a predetermined microwave electric signal;

means for generating a wave having a frequency that is triple a frequency of the fundamental wave;

delay means for adjusting a phase difference between the fundamental wave being the microwave electric signal and the wave having a frequency that is triple a frequency of the fundamental wave;

means for mixing the fundamental wave and the triple-frequency wave and splitting the mixed wave into two signals having a phase difference of substantially 90 degrees; and

means for supplying electricity to the input section to which is input a signal used for modulating the signals;

wherein a noise component included in an output of the Mach-Zehnder interferometer type SSB modulator generated in accordance with the phase difference between the two

signals having a phase difference of substantially 90 degrees is suppressed by adjusting a bias voltage applied to the third electrode in accordance with the phase difference between the two signals.

Claim 6 (Cancelled).

Claim 7 (Previously Presented): The low-noise optical frequency converter according to claim 5, wherein the means for splitting the mixed fundamental wave and triple-frequency wave into two signals having a phase difference of substantially 90 degrees is a 90-degree hybrid.

Claim 8 (Currently Amended): ~~The~~ A low-noise optical frequency converter, comprising: ~~according to claim 4, wherein~~

a light wave input section;

a modulation signal input section;

a modulated light wave output section;

a Mach-Zehnder interferometer type single sideband (SSB) modulator configured to modulate a light wave input to the light wave input section, provided with a first Mach-Zehnder interferometer type phase modulator and a second Mach-Zehnder interferometer type phase modulator on respective optical paths;

a first electrode configured to control a phase of a light wave provided on the first Mach-Zehnder interferometer type phase modulator;

a second electrode configured to control a phase of a light wave provided on the second Mach-Zehnder interferometer type phase modulator;

a third electrode configured to control a phase of a light wave propagating through each arm of the Mach-Zehnder interferometer type SSB modulator;

means for inputting a predetermined microwave electric signal;

means for splitting the microwave electric signal into two signals having a phase difference of substantially 90 degrees; and

means for applying the two signals to the modulation signal input section; wherein a noise component included in an output of the Mach-Zehnder interferometer type SSB modulator generated by the phase difference between the two signals having the phase difference of substantially 90 degrees is suppressed by adjusting a bias voltage applied to the third electrode in accordance with the phase difference between the two signals;

wherein the predetermined microwave electric signal is a microwave electric signal with a periodically changing frequency, with a frequency of output light changing in accordance with the frequency of the microwave electric signal.

Claim 9 (Original): The low-noise optical frequency converter according to claim 5, wherein

the predetermined microwave electric signal is a microwave electric signal with a periodically changing frequency, with a frequency of output light changing in accordance with the frequency of the microwave electric signal.

Claim 10 (Currently Amended): ~~The~~ A low-noise optical frequency converter, comprising: ~~according to claim 6, wherein~~

a light wave input section;

a modulation signal input section;

a modulated light wave output section;

a Mach-Zehnder interferometer type signal sideband (SSB) modulator configured to modulate a light wave input to the light wave input section and provided with a first Mach-Zehnder interferometer type phase modulator and a second Mach-Zehnder interferometer type phase modulator on respective optical paths;

a first electrode configured to control a phase of a light wave provided on the first Mach-Zehnder interferometer type phase modulator;

a second electrode configured to control a phase of a light wave provided on the second Mach-Zehnder interferometer type phase modulator;

a third electrode configured to control a phase of a light wave propagating through each arm of the Mach-Zehnder interferometer type SSB modulator;

means for inputting a predetermined microwave electric signal;

means for splitting the microwave electric signal into two signals having a phase difference of substantially 90 degrees; and

means for applying the two signals to the modulation signal input section; wherein a noise component included in an output of the Mach-Zehnder interferometer type SSB modulator generated by the phase difference between the two signals having the phase difference of substantially 90 degrees is suppressed by adjusting a bias voltage applied to the third electrode in accordance with the phase difference between the two signals;

wherein the means for splitting the microwave electric signal into two signals having a phase difference of substantially 90 degrees is a 90-degree hybrid; and

wherein the predetermined microwave electric signal is a microwave electric signal with a periodically changing frequency, with a frequency of output light changing in accordance with the frequency of the microwave electric signal.

Claim 11 (Original): The low-noise optical frequency converter according to claim 7, wherein

the predetermined microwave electric signal is a microwave electric signal with a periodically changing frequency, with a frequency of output light changing in accordance with the frequency of the microwave electric signal.

Claim 12 (Previously Presented): The low-noise optical frequency converter according to claim 8, wherein

the predetermined microwave electric signal is a microwave electric signal having a frequency that changes on a time basis, a correspondence between the frequency and an optimum value for suppressing the noise component to which a bias voltage inside the Mach-Zehnder interferometer type SSB modulator is adjusted based on the frequency is obtained beforehand and the correspondence is used for adjusting to suppress the noise component.

Claim 13 (Previously Presented): The low-noise optical frequency converter according to claim 9, wherein

the predetermined microwave electric signal is a microwave electric signal having a frequency that changes on a time basis, a correspondence between the frequency and an optimum value for suppressing the noise component, to which a bias voltage inside the Mach-Zehnder interferometer type SSB modulator is adjusted based on the frequency, is obtained beforehand and the correspondence is used for adjusting to suppress the noise component.

Claim 14 (Previously Presented): The low-noise optical frequency converter according to claim 10, wherein

the predetermined microwave electric signal is a microwave electric signal having a frequency that changes on a time basis, a correspondence between the frequency and an optimum value for suppressing the noise component, to which a bias voltage inside the Mach-Zehnder interferometer type SSB modulator is adjusted based on the frequency, is obtained beforehand and the correspondence is used for adjusting to suppress the noise component.

Claim 15 (Previously Presented): The low-noise optical frequency converter according to claim 11, wherein

the predetermined microwave electric signal is a microwave electric signal having a frequency that changes on a time basis, a correspondence between the frequency and an optimum value for suppressing the noise component, to which a bias voltage inside the Mach-Zehnder interferometer type SSB modulator is adjusted based on the frequency, is obtained beforehand and the correspondence is used for adjusting to suppress the noise component.